

Habitat Enhancement Project Update-7-7-05

Current Status of Site Selection Process:

To determine the most appropriate location for the proposed reef, *Marine Fisheries* is performing a comprehensive pre-installation evaluation and survey of Salem Sound and Boston Harbor. A simple model was developed to select potential sites for habitat enhancement using ESRI's ArcGIS 9.0 mapping software. Three parameters were chosen for use in our model: substrate, bathymetry, and proximity to the pipeline. These data layers were coded to represent prime, potential, and unsuitable areas for habitat enhancement and multiplied together to create a single layer map (Figures IVB.3-IVB.6). The results of this model identified four prime locations for potential reef sites (29.6 acres total); within these areas 24 sites (and 5 alternate sites) were selected within 1000 ft. of the HubLine pathway. Through the use of GIS, 80% of potential reef area was eliminated prior to field assessments. Sites that are the closest in proximity to the HubLine will be preferred over sites further away from the pathway.

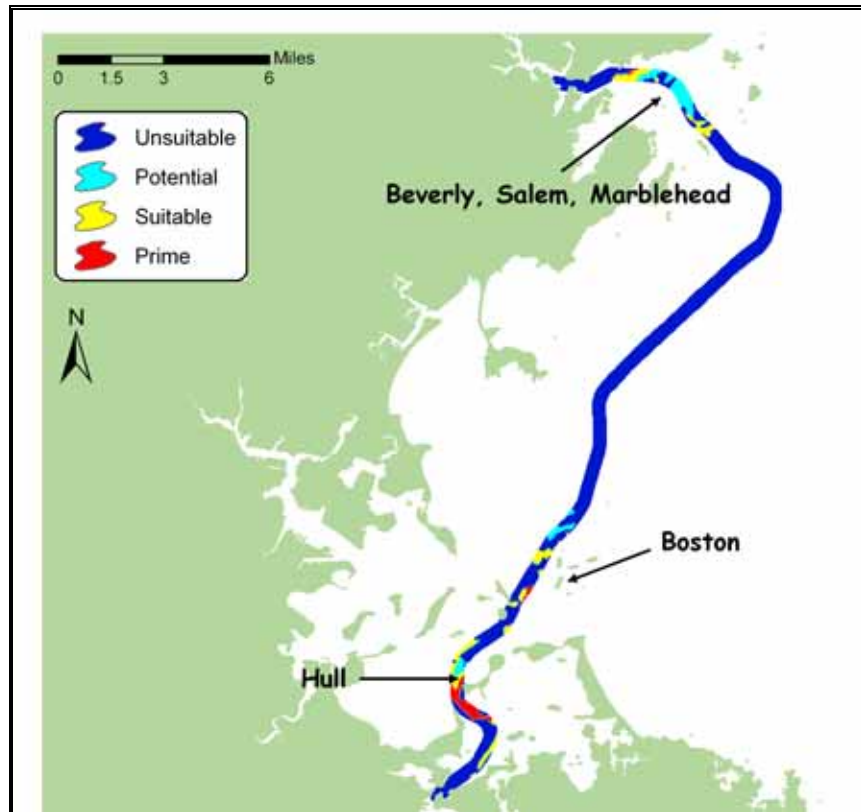


Figure IVB.3. Locus map of potential sites for habitat enhancement project

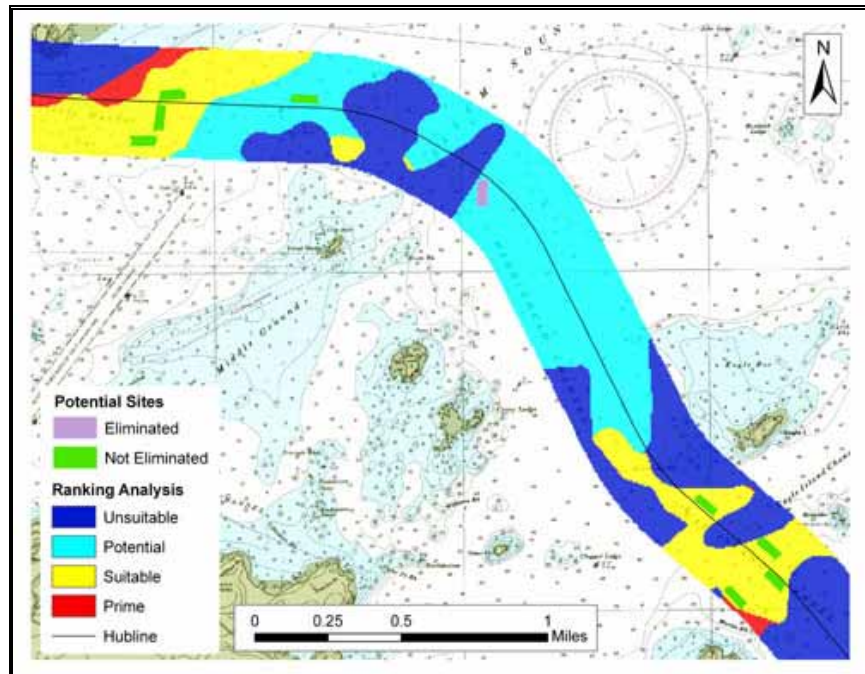


Figure IVB.4. Map of potential sites in Marblehead, Salem, and Beverly

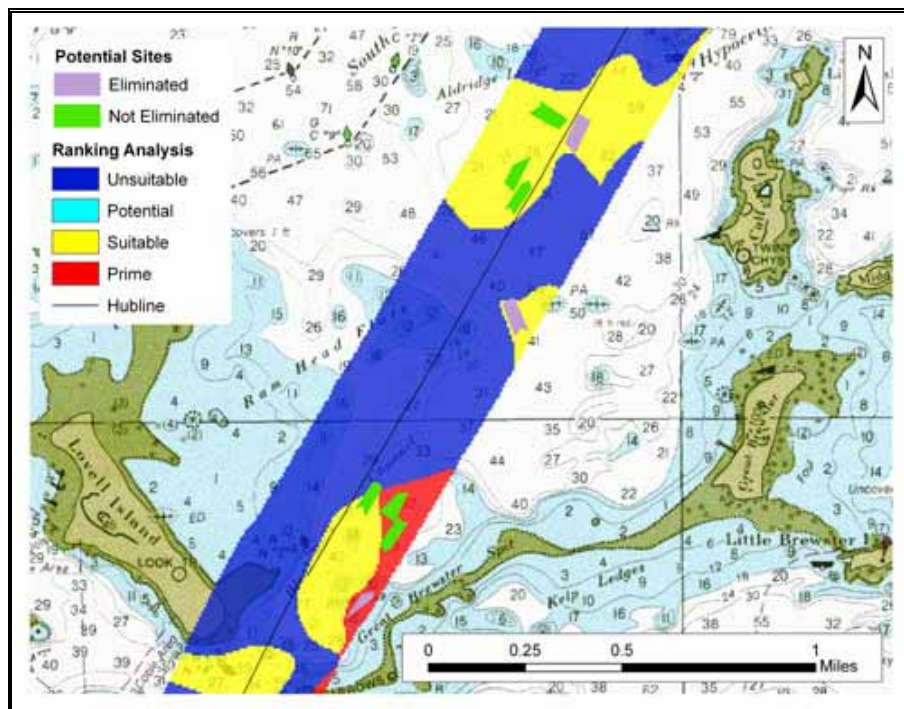


Figure IVB.5. Map of potential site locations in Boston.

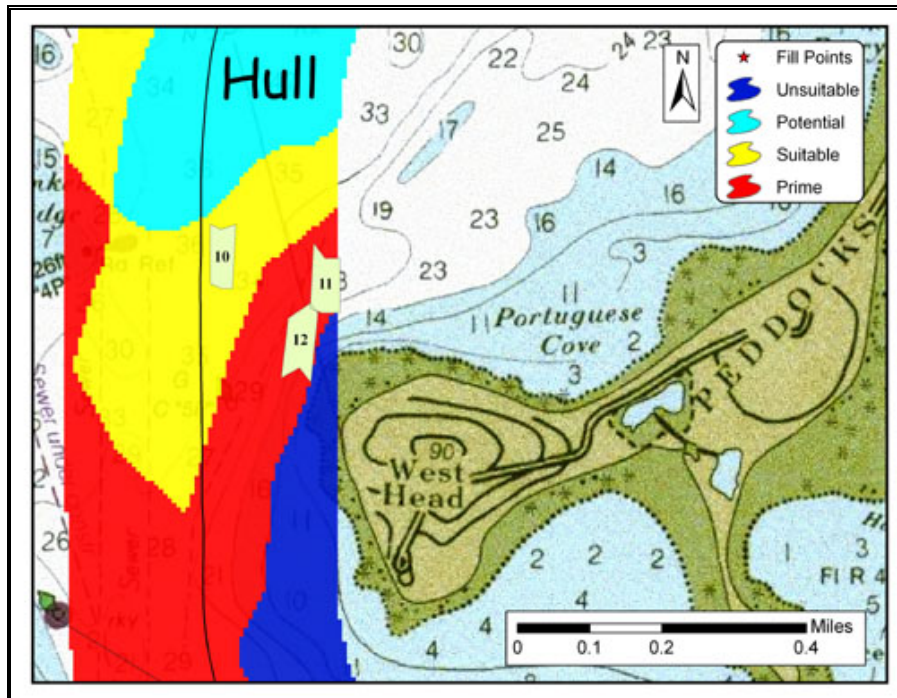


Figure IVB.6. Map of potential site locations in Hull.

After this initial selection modeling and the development of the database, we collected bathymetry data in the field at each of these 24 potential sites. These data were used to verify the GIS model and calculate slope. Upon completion of this task, 8 sites were eliminated and the remaining 19 sites were ranked according to their slope. All remaining potential sites have a flat to 2° slope. After careful consideration of these 17 sites, three more sites were eliminated due to historically poor larval settlement in the general area, high siltation rates, and concern for safety of employees due to boat traffic.

All 14 remaining potential sites are within 6.8 miles to the nearest harbor, and in the 20 to 50 ft. MLLW depth range. Therefore, all potential sites are accessible to recreational and commercial fisherman, scientists, recreational SCUBA divers, and other interested user groups. No sites are located within shipping channels marked on NOAA charts. Additionally, *Marine Fisheries* has discussed the habitat enhancement project with the Massachusetts Lobstermen's Association and we do not anticipate any adverse reactions from commercial lobstermen. No other commercial fishing activities are expected to occur within potential site areas due to shellfish closures and shallow, undesirable depths for large-scale fishing practices such as trawling.

Transect surveys are currently being conducted via SCUBA to classify and determine the stability of substrate at each site. A total of 23 survey dives have been completed at 8 sites. All sediment data collected have been logged into an MS-Access database to facilitate a detailed site analyses at the conclusion of the data collection process.

In addition to sediment classification, bottom water currents are being monitored at the potential sites using a modified PVC clod-card design, referred to as the Dimond Design, to indicate the prevalent current direction (Figure IVB.7). Attrition of plaster within the tubes is measured after 48-hour exposure to seawater flow. *Marine Fisheries* is also using a flowmeter to collect data on relative current strength.



Figure IVB.7. The Dimond Design used for measuring prevalent current direction.

Upon completion of the sediment classification analysis, each remaining site will be ranked according to its suitability based on the site selection criteria defined in this document. The three sites with the highest overall ranking will be selected for the final site selection process. Additional biological and physical data including: larval supply, species abundance and diversity, and sedimentation rate will be collected at these sites. These data will allow for the selection of a site with high recruitment potential and avoid placing the reef on pre-existing productive habitat. It is important to note that no submerged aquatic vegetation (SAV) will be affected by the reef due to the targeted reef depth and substrate type. We are also working closely with the U.S. Geological Survey (USGS) and using their data (side-scan and multibeam imagery) on substrate type from Massachusetts Bay. In addition to benefiting from their high-quality data, we will also be sharing our substrate data with USGS to assist in ground-truthing their multibeam data.

Other equipment has been constructed and gathered in preparation for near-future work in the final site selection process including:

- PVC square meter quadrats
- Larval settlement collectors
- Temperature/light underwater data loggers

Current Status of Permitting Process:

The following details the work and meetings we have attended as a necessary part of the permitting process. At this time, we are in the process of obtaining the Order of Conditions from Boston, Beverly, and Marblehead.

- January 8, 2005: *Marine Fisheries* prepared and presented a review of the habitat enhancement project for an Army Corps of Engineers pre-application meeting;
- April 25, 2005: *Marine Fisheries* prepared and presented a review of the habitat enhancement project for MEPA and DEP analysts in order to obtain verification of MEPA status and requirements;
- May 3, 2005: *Marine Fisheries* prepared and presented a review of the habitat enhancement project for the town of Beverly, MA. We will be receiving an Order of Conditions within the next few weeks from this town, giving us permission from this town to place the reef in its' waters, provided the final site is selected in Beverly;

- May 18, 2005: *MarineFisheries* prepared and presented a review of the habitat enhancement project for the city of Boston for possible reef placement and received the approval/Order of Conditions;
- May 19, 2005: *MarineFisheries* prepared and presented a review of the habitat enhancement project to the town of Marblehead and received the approval;
- Essential Fish Habitat (EFH) report: *MarineFisheries* has prepared this report as suggested by the Army Corps of Engineers;
- Request for Response (RFR): *MarineFisheries* is currently preparing this document for the eventual acceptance of bids to complete the task.

Public Awareness:

The habitat enhancement project has dedicated time towards public awareness by developing posters and pamphlets and presenting these items at the following functions:

- February 4, 2005: Massachusetts Lobsterman Association (MLA) tradeshow;
- February 9, 2005: Bay State Council meeting;
- February 16, 2005: Shell Disease meeting at the University of Rhode Island;
- April 6 – 8, 2005: Benthic Ecology Meeting in Williamsburg, VA ;
- April 9 – 14, 2005: Artificial Reef Conference in Biloxi, MS.